UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/537,477	06/03/2005	Toshiharu Kobayashi	P/2850-110	3344

2352 7590 09/19/2007

OSTROLENK FABER GERB & SOFFEN
1180 AVENUE OF THE AMERICAS
NEW YORK, NY 100368403

EXAMINER	
FOGARTY, CAITLIN ANNE	
ART UNIT	**PAPER NUMBER**
1709	
MAIL DATE	**DELIVERY MODE**
09/19/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/537,477	KOBAYASHI ET AL.	
	Examiner	Art Unit	
	Caitlin Fogarty	1709	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03 June 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *See Continuation Sheet*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :03 June 2005, 01 December 2005, and 20 November 2006.

DETAILED ACTION

Status of Application

1. Claims 1 – 24 are pending and presented for the examination.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

3. The three information disclosure statements (IDSs) were submitted on June 3, 2005, December 1, 2005, and November 20, 2006, respectively. These submissions are in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statements are being considered by the examiner. The Japanese Office Action listed in the IDS received on December 1, 2005 did not have a date and will therefore not be considered. Also, the International Search Report listed in the IDS received on November 20, 2006 is not a document and will not be considered. Please refer to applicants' copy of form PTO-1449 submitted herewith.

Claim Rejections - 35 USC § 102/103

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1 – 24 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Cetel et al. (EP 0 848 071 A1).

In regards to claim 1, page 2 lines 29 – 36 of Cetel et al. disclose a nickel based single crystal super alloy with a clearly overlapping composition as shown in Table 1.

Table 1

Element	Claim 1 (Weight %)	Cetel et al. (Weight %)	Overlapping Range (Weight %)
Al	5.0 – 7.0	5.0 – 7.0	5.0 – 7.0
Ta	4.0 – 10.0	4.0 – 8.0	4.0 – 8.0
Mo	1.1 – 4.5	0 – 4.0	1.1 – 4.0
W	4.0 – 10.0	5.0 – 10.0	5.0 – 10.0
Re	3.1 – 8.0	0 – 8.5	3.1 – 8.0
Hf	0 – 0.50	0 – 3.0	0 – 0.50
Cr	2.0 – 5.0	0.4 – 2.9	2.0 – 2.9
Co	0 – 9.9	3.0 – 20.0	3.0 – 9.9
Ru	4.1 – 14.0	0 – 10.0	4.1 – 10.0
Ni + impurities	balance	balance	balance

Claim 2 recites the same super alloy as claim 1 (see Table 1) but with 4.0 – 6.0 wt% Ta that has an overlapping range with Cetel et al. of 4.0 – 6.0 wt%.

Claim 3 recites the same super alloy as claim 1 (see Table 1) but with 4.0 – 6.0 wt% Ta that has an overlapping range with Cetel et al. of 4.0 – 6.0 wt% and 2.9 – 4.5 wt% Mo that has an overlapping range with Cetel et al. of 2.9 – 4.0 wt%.

In regards to claims 4 – 6, page 2 lines 29 – 36 of Cetel et al. disclose a nickel based single crystal super alloy with a clearly overlapping composition as shown in Table 2.

Table 2

Element	Claim 4 (Weight %)	Claim 5 (Weight %)	Claim 6 (Weight %)	Cetel et al. (Weight %)
Al	5.9	5.8	5.8	5.0 – 7.0
Ta	5.9	5.6	5.8	4.0 – 8.0
Mo	3.9	3.1	3.9	0 – 4.0
W	5.9	5.8	5.8	5.0 – 10.0
Re	4.9	4.9	4.9	0 – 8.5
Hf	0.10	0.10	0.10	0 – 3.0
Cr	2.9	2.9	2.9	0.4 – 2.9
Co	5.9	5.8	5.8	3.0 – 20.0
Ru	5.0	5.0	6.0	0 – 10.0
Ni + impurities	Balance	Balance	Balance	Balance

In regards to claims 7 – 9, claim 7 recites the Ni-based single crystal super alloy of claim 1 further comprising 0 – 2.0 wt% of Ti in terms of weight ratio. Claim 8 recites the Ni-based single crystal super alloy of claim 1 further comprising 0 – 4.0 wt% of Nb in terms of weight ratio. Claim 9 recites the Ni-based single crystal super alloy of claim 1 further comprising at least one of the elements selected from B, C, Si, Y, La, Ce, V and Zr. Cetel et al. teaches the super alloy of claim 1 with 0 – 1.5 wt% Ti, 0 – 2.0 wt% Nb, 0 – 1 wt% Y, 0 – 1 wt% La, and 0 – 1.0 wt% V (see p. 2 lines 29 – 36).

In regards to claims 10 and 11, page 2 lines 29 – 36 of Cetel et al. disclose a nickel based single crystal super alloy with a clearly overlapping composition as shown in Tables 3 and 4.

Table 3

Element	Claim 10 (Weight %)	Cetel et al. (Weight %)	Overlapping Range (Weight %)
Al	5.0 – 7.0	5.0 – 7.0	5.0 – 7.0
Ta	4.0 – 10.0	4.0 – 8.0	4.0 – 8.0
Mo	1.1 – 4.5	0 – 4.0	2.9 – 4.0
W	4.0 – 10.0	5.0 – 10.0	5.0 – 10.0
Re	3.1 – 8.0	0 – 8.5	3.1 – 8.0
Hf	0 – 0.50	0 – 3.0	0 – 0.50
Cr	2.0 – 5.0	0.4 – 2.9	2.0 – 2.9
Co	0 – 9.9	3.0 – 20.0	3.0 – 9.9
Ru	4.1 – 14.0	0 – 10.0	4.1 – 10.0
Ni + impurities	Balance	Balance	Balance
B	≤ 0.05	—	0
C	≤ 0.15	—	0
Si	≤ 0.1	—	0
Y	≤ 0.1	0 – 1	0 – 0.1
La	≤ 0.1	0 – 1	0 – 0.1
Ce	≤ 0.1	—	0
V	≤ 1	0 – 1.0	0 – 1.0
Zr	≤ 0.1	—	0

Table 4

Element	Claim 11 (Weight %)	Cetel et al. (Weight %)	Overlapping Range (Weight %)
Al	5.0 – 7.0	5.0 – 7.0	5.0 – 7.0
Ta	4.0 – 10.0	4.0 – 8.0	4.0 – 8.0
Mo	1.1 – 4.5	0 – 4.0	2.9 – 4.0
W	4.0 – 10.0	5.0 – 10.0	5.0 – 10.0
Re	3.1 – 8.0	0 – 8.5	3.1 – 8.0
Hf	0 – 0.50	0 – 3.0	0 – 0.50
Cr	2.0 – 5.0	0.4 – 2.9	2.0 – 2.9
Co	0 – 9.9	3.0 – 20.0	3.0 – 9.9
Ru	10.0 – 14.0	0 – 10.0	10.0
Ni + impurities	Balance	Balance	Balance
Nb	≤ 4.0	0 – 2.0	0 – 2.0

Ti	≤ 2.0	0 – 1.5	0 – 1.5
B	≤ 0.05	—	0
C	≤ 0.15	—	0
Si	≤ 0.1	—	0
Y	≤ 0.1	0 – 1	0 – 0.1
La	≤ 0.1	0 – 1	0 – 0.1
Ce	≤ 0.1	—	0
V	≤ 1	0 – 1.0	0 – 1.0
Zr	≤ 0.1	—	0

Claim 12 recites the same super alloy as claim 11 (see Table 4) but with 5.8 – 7.0 wt% Al (overlapping range: 5.8 – 7.0 wt%), 4.0 – 5.6 wt% Ta (overlapping range: 4.0 – 5.6 wt%), 3.3 – 4.5 wt% Mo (overlapping range: 3.3 – 4.0 wt%), 2.9 – 4.3 wt% Cr (overlapping range: 2.9 wt%), and 4.1 – 14.0 wt% Ru (overlapping range: 4.1 – 10.0 wt%).

Claim 13 recites the same super alloy as claim 11 (see Table 4) but with 2.9 – 5.0 wt% Cr (overlapping range: 2.9 wt%) and 6.5 – 14.0 wt% Ru (overlapping range: 6.5 – 10.0 wt%).

Claim 14 recites the same super alloy as claim 11 (see Table 4) but with 4.0 – 6.0 wt% Ta (overlapping range: 4.0 – 6.0 wt%), 3.3 – 4.5 wt% Mo (overlapping range: 3.3 – 4.0 wt%), and 4.1 – 14.0 wt% Ru (overlapping range: 4.1 – 10.0 wt%).

Claim 15 recites the same super alloy as claim 11 (see Table 4) but with 4.0 – 5.6 wt% Ta (overlapping range: 4.0 – 5.6 wt%), 3.3 – 4.5 wt% Mo (overlapping range: 3.3 – 4.0 wt%), and 4.1 – 14.0 wt% Ru (overlapping range: 4.1 – 10.0 wt%).

Claim 16 recites the same super alloy as claim 11 (see Table 4) but with 3.1 – 4.5 wt% Mo (overlapping range: 3.1 – 4.0 wt%), and 4.1 – 14.0 wt% Ru (overlapping range: 4.1 – 10.0 wt%).

Claim 17 recites the same super alloy as claim 11 (see Table 4) but with 5.8 – 7.0 wt% Al (overlapping range: 5.8 – 7.0 wt%), 3.1 – 4.5 wt% Mo (overlapping range: 3.1 – 4.0 wt%), and 4.1 – 14.0 wt% Ru (overlapping range: 4.1 – 10.0 wt%).

Claim 18 recites the same super alloy as claim 11 (see Table 4) but with 3.1 – 4.5 wt% Mo (overlapping range: 3.1 – 4.0 wt%), 2.9 – 4.3 wt% Cr (overlapping range: 2.9 wt%) and 4.1 – 14.0 wt% Ru (overlapping range: 4.1 – 10.0 wt%).

Claim 19 recites the same super alloy as claim 11 (see Table 4) but with 4.0 – 10.0 wt % Ta + Nb + Ti (overlapping range: 4.0 – 10.0), 3.3 – 4.5 wt% Mo (overlapping range: 3.3 – 4.0 wt%), and 4.1 – 14.0 wt% Ru (overlapping range: 4.1 – 10.0 wt%).

Since the claimed ranges for claims 1 - 19 either overlap or are within the ranges disclosed by Cetel et al., a prima facie case of obviousness exists. See MPEP 2144.05. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the nickel based super alloy compositions from the nickel based super alloy composition disclosed by Cetel et al. because Cetel et al. discloses the same utility throughout the disclosed ranges.

In regards to claims 20 – 24, claim 20 recites the Ni-based single crystal super alloy according to claim 1 wherein, when lattice constant of matrix is taken to be a1 and lattice constant of precipitation phase is taken to be a2, $a2 \leq 0.999a1$. Claim 21 recites a Ni-based single crystal super alloy according to claim 20 wherein the lattice constant of the precipitation phase a2 is 0.9965 or less of the lattice constant of the matrix a1. Claim 22 recites a Ni-based single crystal super alloy, wherein the lattice constant of its precipitation phase a2 is 0.9965 or less of the lattice constant of its matrix a1, and

having a composition including Re and Ru, and 2.9-4.5 wt% of Mo. Claim 23 recites a Ni-based single crystal super alloy, wherein the lattice constant of its precipitation phase a2 is 0.9965 or less of the lattice constant of its matrix a1, and having a composition including 2.9-4.5 wt% of Mo, 3.1-8.0 wt% of Re and 4.1-14.0 wt% of Ru. Claim 24 recites a Ni-based single crystal super alloy according to claim 1 wherein a dislocation space of the alloy is 40 nm or less.

Cetel et al. does not disclose the lattice constant or the dislocation space of the nickel based single crystal super alloy. However, since the lattice constant and dislocation space are both inherent physical properties of the Ni-based single crystal super alloy, the super alloy disclosed by Cetel et al. would have the same inherent properties as that of the instant application because the compositions overlap, which is a prima facie case of obviousness. See MPEP 2112.01. As discussed above, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select the nickel based super alloy compositions from the nickel based super alloy composition disclosed by Cetel et al. because Cetel et al. discloses the same utility throughout the disclosed ranges.

Double Patenting

7. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140

F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

8. Claims 1 – 24 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 - 3 of U.S. Patent No. 6,966,956 B2. Although the conflicting claims are not identical, they are not patentably distinct from each other because the compositions of the super alloys recited in the instant application overlap with the compositions of the super alloys disclosed in US 6,966,956 B2. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the nickel based super alloy compositions from the nickel based super alloy compositions disclosed in US 6,966,956 B2.

Conclusion

9. No claim is allowed. All pending claims are rejected.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Caitlin Fogarty whose telephone number is 571-270-3589. The examiner can normally be reached on Monday - Friday 8:00 AM - 5:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vickie Kim can be reached on (571) 272-0579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CF